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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,943	10/17/2003	Sivakumar Muthuswamy	CM01523LD01	9908

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MOTOROLA, INC
INTELLECTUAL PROPERTY SECTION
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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1745

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/687,943	MUTHUSWAMY ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 and 3-9 is/are allowed.
- 6) ☒ Claim(s) 10-12 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1, 3-12, and 17-19. Claims 1 and 3-9 are allowed. Although they have been amended, claims 10-12 and 17-19 remain rejected over the JP '555 in view of Fredley. Accordingly, this action is made final.

Terminal Disclaimer

2. The terminal disclaimer filed on January 13, 2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patents 6,743,543 and 6,699,611 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

3. Claims 10-12 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-267555 as evidenced by Kakuta et al (U.S. Patent 4,799,762), in view of Fredley (U.S. Patent 5,998,058).

JP '555 is directed to a fuel cell comprising an MEA consisting of an electrolyte membrane and electrocatalysts (see abstract, paragraph 53 of the machine translation). Electrically conductive gas-diffusion layers (12, 13) are disposed on the MEA (see abstract).

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The gas diffusion layers comprise organic fibers (see paragraph 45), which may include fluoro-resin, polyester, or acrylic (see paragraphs 45 and 50). These materials each have a positive coefficient of thermal expansion, as shown in column 3, line 55 of Kakuta et al.:

Examples of the resin having a positive coefficient α' of linear expansion used in the present invention, include thermo-plastic resins, such as polyamides, polyamide elastomers, polyester elastomers, polyurethanes, polyesters, polyethylenes, polyvinyl chlorides, polystyrenes, polyfluorocarbons and the like, and resins cross-linked by heat, light, water, electron beam or the like so as to be hardened, such as epoxy polymers, acrylic polymers and the like. It is preferable that the value of α' is

Accordingly, since the organic fibers of JP '555 have a positive coefficient of thermal expansion, the gas diffusion layer would inherently be responsive to the temperature of the MEA. As such, the porosity of the gas diffusion layer would decrease with increasing temperature, thereby selectively limiting the amount of reactants reaching localized areas of the MEA. It is further noted that the polymer species of JP '555 are considered to read on the claimed "polymer fibers exhibiting positive coefficient of thermal expansion" and "thermoreponsive polymers exhibiting positive (negative) swelling in fibrous form."

JP '555 does not expressly teach that the gas diffusion layer is microporous, as recited in claims 10 and 18.

Fredley is directed to polymer electrolyte fuel cells having electrode support diffusion layers (40, 42) (see Figure 2). In column 6, lines 9-16, the reference teaches that the support layers are made of carbon fiber and have mean pore diameters of about 10-60 microns.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Fredley would motivate the

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artisan to use a mean pore size of 10-60 microns in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous." In column 6, line 9, Fredley discloses that the "manufacture of an improved porous support layer 40, 42 of the present invention includes treating a carbon fiber substrate having mean pore diameters and total pore volume appropriate for efficient transfer of fluids in an electrochemical cell such as the described fuel cell 10." Since Fredley identifies pore diameters of 10-60 microns as being suitable, the artisan would be motivated to use this pore size in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous."

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

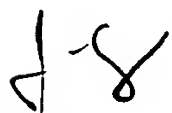
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299.

The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1745
June 4, 2006